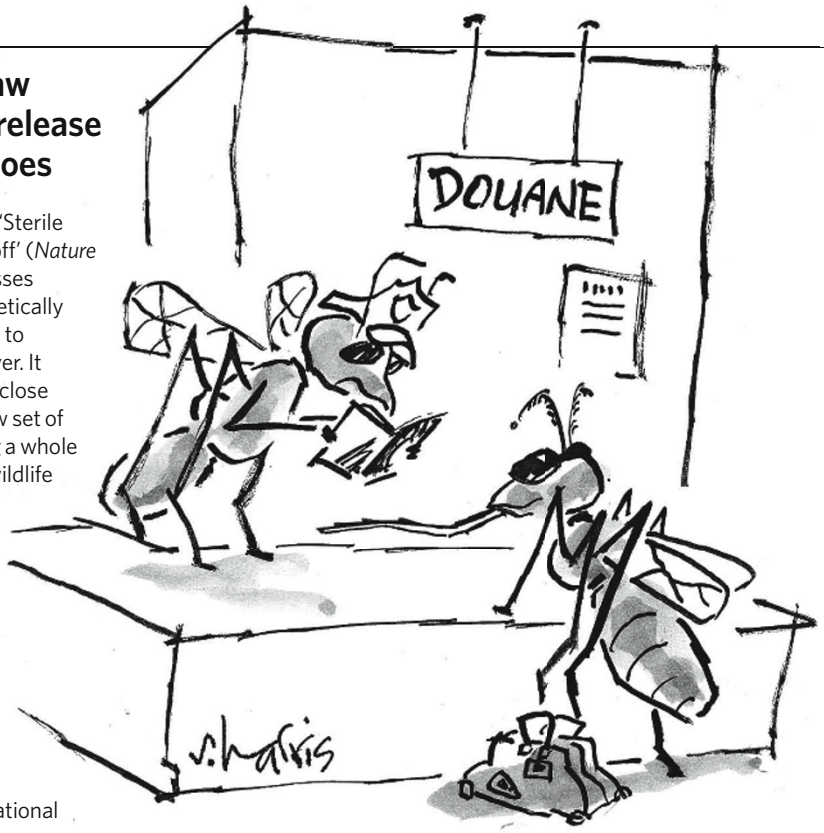
CORRESPONDENCE

International law should govern release of GM mosquitoes



SIR — Your News story 'Sterile mosquitoes near take-off' (*Nature* **453,** 435; 2008) discusses the likely release of genetically engineered mosquitoes to help contain dengue fever. It demonstrates just how close we are to a radically new set of strategies for managing a whole range of diseases and wildlife using genetically modified organisms (GMOs). But after assessing the risks and benefits, nations may reach different conclusions about their use. And that's quite a problem, considering that genetically modified bugs won't recognize national borders.

Malaysia may successfully avoid spreading the sterile mosquitoes across the border, and even if they do cross, any transgression will be limited to a single lifespan. Strategies that rely on genetically modifying mosquitoes that can still reproduce, such as those that you mention are being engineered by Austin Burt's team for malaria control, are more likely to have lingering effects as they spread among wild populations across national borders.

Although everyone would agree that diseases are bad, nations may have very different views about how they should be prevented. Effective control of mosquito-borne disease will not be achieved without regionally coordinated programmes, so a robust framework is needed to accommodate the differences (B. G. J. Knols *et al. Am. J. Trop. Med. Hyg.* **77,** 232–242; 2007).

Nations have a right to decide the technological risks to which they expose themselves. The factors in decision-making here will not be only the simple ones of uncontested science — this is politics, and appropriately so. The potential for conflict over self-dispersing GMOs demands the attention of international law.

Unfortunately, that law is deficient. The most relevant treaty is the Convention on Biological Diversity and its instrument, the Cartagena Protocol on Biosafety. The protocol includes Malaysia and most of its neighbours — Thailand, Indonesia, Cambodia and Vietnam — but not Singapore or Australia. It falls far short of the proactive and instructive approach necessary for the deployment of GMOs designed to be self-dispersing and reproducing in the wild.

The world needs to get involved. Discussions should be formalized, ideally under the biodiversity convention, and widely accessible (for example, through the convention's Biosafety Clearing House). This trial would set the tone for future negotiations over this very new kind of biotechnology.

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Future of open access could be online and peer-reviewed

SIR — Raghavendra Gadagkar (*Nature* **453,** 450; 2008) argues that the open-access 'pay to publish and read for free' model leads to a disadvantage for scientists in developing countries. I disagree. Gadagkar correctly states: "page charges may be waived for authors who cannot afford to pay." He then adds: "a model that depends on payment by authors can afford only a few such waivers." This is not necessarily true: for example, some open-access journals provide discounts to particular institutions.

I would prefer to see what little money is available to a developing country spent on helping to publish their scientists' papers rather than financing publishing houses based in First World countries. At present, open-access publication may be hard for those in the developing world to afford, but in the long run it will be advantageous, offering them free access to educational and academic resources.

Most important, the future of open access probably does not lie in journal publishing models. The huge success of online literature databases such as arXiv (http://arxiv.org), free to publish and access, is significant. Such databases currently host mostly non-peer-reviewed preprints, and so are of little value for career building. But academic organizations throughout the world could, if they wished, build an equivalent archive of peer-reviewed papers.

I also disagree with Gadagkar's view: "If I must choose between publishing or reading, I would choose to publish". No one can expect to do serious science without access to the current academic literature.

Although many subscription journals are free to access online in developing countries through the HINARI, AGORA and OARE initiatives of the United Nations, the principle remains that if you cannot afford to read, you automatically cannot afford to publish. Perhaps Gadagkar will agree next time he is denied access to a fundamental paper for his research because his institution does not subscribe to it.

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Genetic testing must recognize impact of bad news on recipient

SIR — Your Special Report 'Genetic testing for everyone' (*Nature* **453,** 570–571; 2008) discusses the contentious issue of breaking the news about test results. Our experience

"The CDZ model could guide future efforts to explain the relationship between what we see and what we do." see page 167

of conducting genetic-testing enquiries in Colombia, which has the largest kindred in the world with familial Alzheimer's disease, indicates that individual resilience may vary greatly. Justifying relaxation of recommendations for vigilance on the basis of findings "that most people are remarkably resilient in the face of traumatic genetic test results" gives short shrift to those who are not.

When we asked a 24-year-old man whose mother harbours the highly penetrant presenilin mutation what he would do if he tested positive for the gene, he indicated that he would shoot himself in the head. Although he would probably have another 24 dementia-free years ahead of him, because the average age of disease onset in this community is 48 and variation around the mean is relatively small, the eventuality of a disease many years in the future pervaded his thinking.

Seeking predictive genetic testing can be a risky behaviour, and an individual's likely response to genetic risk is hard to foretell. Functional magnetic resonance imaging activity patterns may be able to define people who are more comfortable with risk, and genetic polymorphisms seem to contribute to risk-taking behaviour. Defining the scientific basis for how individuals handle volatile genetic information may help guide our decisions about the best setting for delivering predictive-testing news.

At what point does genetic destiny overtake the hope of beating the odds? In the Colombian families, an affected parent already sets the risk of disease at 50%, a level that in our experience creates significant anxiety but is tolerable.

Genetic testing, whether it offers a stick of dynamite or a stark warning to which we can adapt, must be backed up by reliable, accessible, up-to-date information. For example, the completion of phase III clinical trials can radically alter a bleak message detected in the genome.

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Action needed to prevent extinctions caused by disease

SIR — Your News in Brief item 'Cancer forces Tasmanian devil onto endangered list' highlights the plight of this carnivorous marsupial (*Sarcophilus harrisii*), driven towards extinction by devil facial-tumour disease, which is contagious (*Nature* **453,** 441; 2008). The animal will soon also be uplisted by the 2008 IUCN Red List from its category of Least Concern to Endangered.

Emerging disease has also had a sudden impact on the western gorilla (*Gorilla gorilla*), uplisted in 2007 from Endangered to Critically Endangered, primarily as a result of mortality (more than 90% in some remote areas) induced by Ebola virus (*Nature* **449,** 127; 2007). Disease has caused a 33% decline in the gorilla population over 13–14 years and a 64% decline over 11 years in the devil population, and is set to continue. Such rapid, range-wide population crashes have also been documented in formerly widespread and common amphibian species affected by the pathogenic chytrid fungus (*Nature* **439,** 161–167; 2006).

The multimillion-dollar Save the Tasmanian Devil programme was initiated by Tasmania's Department of Primary Industries and Water in 2003. By contrast, nascent efforts to vaccinate wild gorilla populations with newly developed vaccines against Ebola virus are meeting with resistance from some members of the conservation community, who fear negative impacts during the vaccine-testing process.

The lesson to be learned from each of these diseases is that, although aggressive management actions, such as vaccination, may negatively affect a handful of individuals, they are vital if we are to save entire species.

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Cuddly animals don't persuade poor people to back conservation

SIR — In your Editorial 'Two symbols, one solution' (*Nature* **453,** 427; 2008) on symbols used to publicize the challenges of global warming, you caution against focusing on animals rather than people. But symbols can be powerful — so perhaps what we need instead is to identify a new set to serve the interests of environmental conservation.

The appeal of animals and idyllic forests is not universal. Criticizing this Western imagery, which seems to rate animals more highly than people, has become a rallying cry for local leaders the world over. It tarnishes conservation as a 'new colonialism'. For example, a candidate for the governorship of East Kalimantan (Indonesian Borneo) recently declared that people should take precedence over orangutans (*Pongo pygmaeus*) — a politically pragmatic opinion that is unlikely to change soon in a country where recent figures indicated that 52.4% of the people live on less than US$2 per day.

Here in Indonesia, iconic images show the noble fight against poverty. Again, wild animals are largely irrelevant. Local community members on one of our orangutan conservation programmes were puzzled as to why we didn't help them first — "for we are the *orang utan*" ('forest people').

People in developing countries are seldom against conservation itself, although they may resent the conservation imposed on them. The hard slog of putting conservation into practice — economic planning, land-use allocation, calculation of environmental services, policies, sustainable financing and law enforcement — must be translated into stories and symbols that translate across cultures so that they can be better understood.

The dollar sign, for example, could symbolize opportunity fees that the wealthy would be prepared to pay to implement their own brand of conservation. A ballot paper could signal that conservation is subject to the same democratic checks and balances that we require in other societal choices. Such abstract, process-based ideas are less photogenic than cuddly animals, but they could potentially be key to reducing loss of tropical forests and thereby saving orangutans and other threatened species.

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Correction
In J. M. Swanson and N. D. Volkow's Correspondence (*Nature* **453,** 586; 2008), consumption estimates of stimulant drugs by country in 1995–2006 were wrongly attributed to the World Health Organization. These data were collected for the United Nations by the International Narcotics Control Board, and were taken from the published annual reports.